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REGION I
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# EVALUATION OF THE SIGNIFICANCE OF IMPACTS SEARS ISLAND DRY CARGO TERMINAL SEARSPORT, MAINE

September 29, 1995

Submitted by:
U.S.. Environmental Protection Agency
U.S. Fish & Wildlife Service
National Marine Fisheries Service

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## I. INTRODUCTION

The U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (USFWS), and the National Marine Fisheries Service (NMFS) prepared this document to describe and evaluate the effects of the proposed Sears Island marine dry cargo terminal on aquatic resources, wetlands, and wildlife. The report utilizes the information presented in the Draft Supplemental Environmental Impact Statement (DSEIS) for the project, as well as other information collected during the development of the DSEIS. The text analyzes the environmental impacts of the proposed project in the context of Section 230.10(c) of the EPA 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR 230.10). The federal resource agencies prepared this document to assist the U.S. Army Corps of Engineers in determining compliance with the significance test of the Guidelines.

## II. ENVIRONMENTAL RESOURCE CHARACTERIZATION

Sears Island is an uninhabited 940 acre island approximately one-quarter mile from the mainland in northern Penobscot Bay. A solid fill causeway currently connects the island to the mainland. A road runs along the spine of the island terminating at the west-central shore, and a stone jetty extends into the water at the site of the proposed port facility.[1] The island is 80% forested, and contains more than 200 acres of primarily forested and scrub-shrub wetlands. Numerous intermittent streams currently empty into Penobscot Bay. Vernal pools are scattered throughout the wetlands.

Two saltmarshes exist on the northeastern and northwestern corners of the island. Mudflats and rocky intertidal areas surround the shores of Sears Island. Expansive beds of eelgrass exist off the western shore of the island; smaller beds of eelgrass are present off the eastern shore of the island (Short 1995).

The valuable freshwater wetlands, saltmarshes, eelgrass,

[1] The State constructed the causeway in the 1980s pursuant to Corps of Engineers permits #ME-CAST-84-241 and ME-CAST-86828-R-88. In addition, approximately 10 acres of freshwater wetlands and a stream were filled without a Section 404 permit during construction of the access road and terminal area in 1985. A court order halted further construction when the Sierra Club obtained an injunction in 1989.

mudflats, intertidal and subtidal habitat found on and around Sears Island provide an unusual mixture of high quality habitats all within close proximity. This mixture of habitats results in a high biodiversity of flora and fauna on the island.

## Freshwater and Marine Resources

The Maine Department of Transportation (MDOT) proposes to construct a two-berth marine terminal on the west-central shore of the island. The freshwater wetlands in this area consist primarily of a 23 acre wetland dominated by mixed deciduous-evergreen forest, with some areas of tall shrubs and softwoods (wetland N-1) (see Figure 1).[2] Six intermittent streams drain wetland N-1, and several amphibian breeding sites are scattered throughout the forest.

The intertidal and subtidal marine habitats within and surrounding the proposed project area on Sears Island comprise an uncommonly diverse and productive environment. These areas enhance water quality and provide direct habitat and food chain support for numerous important living marine resources, including many commercially and recreationally valuable species of fish and shellfish.

**Fish and Wildlife Habitat**

Approximately 68% of all wetland dependent birds, mammals, reptiles, and amphibians that occur in this region of Maine have been verified on Sears Island.[3] Wetland N-1 is the largest and most vegetatively diverse wetland in the project area, and therefore has the potential to support a high diversity of wildlife species.

Seventy-nine percent of wetland dependent mammals occurring in this region of Maine were verified on Sears Island. The softwood stand in wetland N-1 provides an important wintering area for white-tailed deer (USFWS Evaluation, p. 8). Wetlands on Sears Island also provide habitat for other mammals, including raccoon,

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[2] Prior to the unauthorized filling performed by MDOT in 1985, wetland N-1 was part of a much larger wetland system approximately 49 acres in size. The 9 acres that were filled connected wetland N-1 to the nearby wetland S-1; this wetland system was the largest freshwater system on Sears Island, and likely provided excellent wildlife habitat for forest interior species.

[3] EPA and USFWS used the New England Transportation Consortium's (NETC) lists of wetland dependent mammals, reptiles and amphibians, and birds to calculate these percentages. NETC defines wetland dependency as animals that may use non-wetlands, but that occur in wetlands most of the year or have life requisites met by wetland habitats that are not met by non-wetland habitats. This estimate does not include bats, sea turtles or marine mammals (except seals, which are included).

mink, southern bog lemming, muskrat, and star-nosed mole. Winter tracking data on Sears Island show that the mixed forested wetland cover types, such as that found in wetland N-1, have a high abundance of mammal species relative to other Sears Island habitats (USFWS Evaluation, p. 8).

The diverse vegetative cover types in wetland N-1 provide feeding, breeding, migration, and wintering habitat for 77% of wetland dependent bird species. In addition, 2 out of 3 (67%) of the wetland dependent jeopardized neotropical migrant species (i.e., species breeding in North America and wintering in Central and South America undergoing serious population decline) found in this region of Maine were verified on Sears Island.[4] Bird survey data for Sears Island show that mixed forested wetlands have a high relative species richness; avian species utilizing wetland N-1 include warblers, vireos, sparrows, and kinglets (USFWS Evaluation, p. 9; see USFWS Evaluation in general for detailed species lists). The moist soils and alder thickets in N-1 provide feeding and nesting habitat for the American woodcock, a species of management concern for USFWS.

Only seven species of wetland dependent reptiles and amphibians were found on Sears Island, but the scope of the amphibian surveys was limited in method and season. Breeding spotted salamanders and wood frogs (obligate vernal pool species) were found in a vernal pool in wetland N-1, and other herptiles that may utilize these areas include blue-spotted salamanders, four-toed salamanders, wood turtles, and ribbon snakes.

Sears Island and its immediate environs provide habitat for 21 state and/or federally listed wildlife species (USFWS Evaluation, p. 29 and Table 4). The bald eagle, federally-listed as threatened, feeds in the waters off the island and perches in trees along the shoreline. Sears Island provides potential nesting habitat for an expanding eagle population in Penobscot Bay. The peregrine falcon, a federally endangered species that has been verified on Sears Island, likely preys on smaller birds along the island's coast. The southern bog lemming (state watch list) and eastern ribbon snake (state special concern list) have been verified on Sears Island, and both utilize wetland habitats similar to N-1.

Prior to the construction of the Sears Island causeway, an intertidal bar connected Sears Island to Kidder Point. The area was dynamic and productive, and supported varied habitat types including sandy flats, cobble/gravel substrates, submergent algal aquatic beds, two pockets of emergent marsh vegetation (presumably Spartina alternaflora), and two pockets of submergent vascular aquatic beds (presumably Zostera marina) (NAI 1993). The bar was partially vegetated with fucoid algae, a source of primary

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[4] Moreover, 85% of the jeopardized neotropical migrant species that utilize wetland habitats and may be adversely affected by the loss of wetlands (but not classified as "wetland dependent" by NETC) have been verified utilizing Sears Island.

biological productivity which supports important food chain resources such as amphipods. The causeway area also supported dense concentrations of blue mussels, soft shell clams, and other benthic invertebrates. Of the 3.7 acres filled for the causeway, approximately 1.5 acres comprised highly productive habitat for soft shell clams (NMFS 1983). The entire area provided suitable foraging habitat for finfish such as Atlantic menhaden, alewife, blueback herring, winter flounder, windowpane flounder, and Atlantic salmon, as well as crustaceans such as rock crabs, lobsters and green crabs. Shorebirds also used the habitats at the bar for feeding during the fall migrations. Heavy use by waterfowl was also recorded prior to causeway construction (NAI 1995b).

The intertidal bar also served as a hydrologic connection linking Long Cove with Stockton Harbor. Before the causeway was constructed, the two waterbodies were connected across the bar for approximately 5 hours at every high tide (FHWA and MDOT 1995). This condition permitted free tidal exchange between the two embayments, allowing natural movement of suspended sediments, nutrients, plankton, shellfish, and finfish.

The intertidal substrate at the proposed terminal site consists primarily of sand mixed with gravel, cobble, and large boulders. This area supports benthic invertebrates including soft shell clams, blue mussels, periwinkles, limpets, and a variety of marine worms. Surveys of the intertidal flats in the proposed project area have documented extremely high biological productivity, including soft shell clam densities far above commercially viable levels for harvesting (FHWA and MDOT 1987). A brief exploratory survey in 1992 did not duplicate the earlier findings, but predation (e.g., by green crabs) may account for a lower standing stock of clams at the time of the 1992 survey. The condition of clam habitat in this area has not changed, which suggests that it would support a future recovery of clam stocks to the high densities documented in the FEIS.

Rocky areas in the intertidal zone are vegetated with fucoid algae, and support associated communities of rock crabs, green crabs, amphipods, polychaetes, barnacles, periwinkles, and epiphytic algae (FHWA and MDOT 1987). This area provides valuable refuge habitat for small forage fish, which can be readily observed in tide pools in the area that would be filled. NMFS and EPA have noted that the interspersion of these macroalgal communities with sandy mud flats and exposed rocky intertidal environments provides attractive foraging habitat for crustaceans and finfish at higher tidal stages. American lobster, hermit crabs, sand shrimp, jonah crabs, horseshoe crabs, pollock, Atlantic mackerel, menhaden, and winter flounder are representative species which likely use these habitats in the project area (NAI 1995).

The shallow subtidal environment in and adjacent to the proposed project site is a soft silty-sand bottom dominated by beds of eelgrass between the low tide line and approximately -10 ft MLW, mixed with scattered rocks and boulders. Eelgrass is a submergent vascular plant with thin strap-like leaves which provides extraordinarily valuable foraging, shelter, breeding and nursery habitat for a variety of fish and shellfish species. The plants typically grow in beds or meadows, creating a dense canopy with vertical and horizontal complexity which is highly attractive to marine organisms. However, even individual shoots of eelgrass may support greater concentrations and diversity of marine life than adjacent unvegetated bottom. Eelgrass beds of varying sizes, including an extensive meadow south of the existing stone jetty, grow in the project area. Virtually the entire shallow subtidal area is suitable eelgrass habitat.

A 1992 survey documented very high levels of biological productivity in the subtidal portion of the project area, including both eelgrass beds and unvegetated inter-patch areas. Small gastropods (whelks, periwinkles, etc.), echinoderms (starfish), and similar organisms live on individual eelgrass plants, and the beds were inhabited by larger fauna such as crabs, lobsters, sea urchins, Atlantic silversides, and menhaden (NMFS 1992). Although not identified during the exploratory survey, additional species which likely use the area include sea scallops, stickleback, tomcod, sand shrimp, seahorses, northern pipefish, winter flounder, windowpane flounder, Atlantic herring, rainbow smelt, alewife, American shad, and white hake (NAI 1995).

The deeper subtidal portion of the proposed project area consists of combined sand and mud bottom with small kelp beds, and is inhabited by scallops, crabs, and a variety of invertebrates (FHWA and MDOT 1987). This region provides feeding habitat for harbor seals from Sears Island ledge to the south, which may prey on migrating or foraging fishes in the area such as menhaden, American shad, Atlantic salmon, Atlantic cod, and pollock.[5]

Coastal wildlife surveys show that the proposed terminal location has a moderately-high abundance and diversity of coastal wildlife relative to all coastal habitat around Sears Island, Kidder Point, Long Cove and Stockton Harbor (USFWS Evaluation, App. I, Fig. 10). Sears Island has three osprey nests, qualifying it as a colonial nesting site. These sites are indicative of a highly productive feeding area for osprey (Penobscot Bay Conservation Plan 1986).

Rocky intertidal, mudflats, and saltmarsh habitats provide feeding habitat for a variety of shore and wading birds, including snowy egret, black-bellied plover, greater and lesser yellowlegs, solitary sandpiper (these five species are all state watch list species[6]), great blue heron, and spotted sandpiper (which also nests in the saltmarsh). Intertidal and subtidal areas provide wintering, feeding, and migration habitat for many other species of waterbirds, including common loon, belted kingfisher, osprey,

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[5] Harbor seals have been observed loafing in the area slated for filling (M. Schweisberg, pers. com.).

[6] Maine Watch List species are species that warrant special attention due to possible population declines, restricted distribution, lack of information, and/or habitat loss.

horned grebe, American black duck (state watch list species), ring-necked duck, common goldeneye, red-breasted merganser, and common eider. The eelgrass beds along the western shoreline provide highly productive feeding areas for waterfowl that eat fish and shellfish.

According to data from EPA's Geographic Information System (GIS) office, 65 islands off the coast of Maine are greater than 250 acres in size. Of these, only 11 have a terrestrial influence such as that found on Sears Island.[7] Of these 11, only four (including Sears Island) are undeveloped or relatively undeveloped.

The federal resource agencies agree with MDOT that the forested wetlands found on Sears Island are not uncommon in the State of Maine; however, EPA and USFWS believe it is unusual to find these types of freshwater systems in such close proximity to the array of marine habitats that exist around Sears Island. In addition, FHWA and MDOT state that "[t]he forest blocks on Sears Island are larger than those that typically occur along the shore of Penobscot Bay" (FHWA and MDOT 1995, Volume 1, p. 3-9). Finally, the eelgrass beds found off Sears Island's central western shore are not common in the region. According to MDOT's consultant, eelgrass beds in Upper Penobscot Bay "represent an important habitat for marine resources in Penobscot Bay and the Gulf of Maine. The area of possible and confirmed beds is small relative to the entire Bay and small relative to the area of the Bay with proper depths for eelgrass growth ... " (Short 1995, p. 8). The consultant concludes that the eelgrass beds found off Sears Island and in other locations within the upper bay are extremely important estuarine habitat. NMFS and EPA agree with this characterization.

**Other functions and values**

Wetland N-1 provides moderate groundwater discharge and water quality protection, including sediment/toxicant retention and nutrient removal/transformation (Smigelski 1992). Other wetlands on Sears Island provide similar functions; in addition, some wetlands adjacent to the shore and perennial stream provide shoreline and streambank stabilization.

The eelgrass in the proposed project area serves several important ecological roles in addition to its habitat value. Its leaf structure serves as a baffle to slow currents and its rhizomes bind and stabilize sediments, thereby reducing localized erosion. The plants also help to remove and synthesize excess nutrients (particularly nitrogen) from the water column, thereby helping to prevent eutrophication (Kenworthy et al. 1982). Additionally, detrital export from eelgrass facilitates secondary biological

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[7] Because of Sears Island's proximity to the mainland and its sheltered position within Penobscot Bay, it is not subject to maritime influence. Islands subject to maritime influences (e.g., microclimates typical of open ocean, salt spray, etc.) have different habitats and different flora and fauna than terrestrial areas farther inland.

productivity by detritivores, which are later consumed by predaceous fish and crustaceans elsewhere in the environs.

## III. DESCRIPTION OF THE PROPOSED ALTERNATIVES

**Alternatives D-1 and D-1.1**

Alternatives D-1 and D-1.1 entail a solid fill nearshore wharf (see Figures 2 and 3).

**Alternatives D-2(A) through D-2(D)**

Alternative D-2(A) consists of a solid fill offshore wharf with the north and south approaches to the wharf on piles (Figure 4). Alternative D-2(B) would consist of a solid fill wharf with the north access to the wharf having box culverts instead of piles (the south access is still pile supported). Alternative D-2(C) would be identical to D-2(B), except that the box culverts would be replaced with circular culverts. Alternative D-2(D) consists of a pile-supported wharf, and pile-supported bridges seaward of mean low water (MLW). This alternative would require approximately 1900 piles.

**Alternatives D-2.1(A) through D-2.1(D)**

Alternatives D-2.1(A), D-2.1(B), D-2.1(C), and D-2.1(D) have identical marine impacts to Alternatives D-2(A) through D-2(D), respectively (Figure 5). However, backland associated with these alternatives in the D-2.1 series has been reduced so that approximately 20 acres of freshwater wetland fill is proposed, as opposed to the 25.5 acres associated with Alternatives D-2(A) through D-2(D).

**Alternatives D-4(A) and D-4(C)**

Alternatives D-4(A) and D-4(C) were developed in an attempt to reduce indirect impacts on freshwater wetlands by combining the access road and the rail along the shore (Figure 6). Direct freshwater wetland filling is increased. Alternative D-4(A) consists of a pile-supported wharf, and pile-supported bridges seaward of mean low water (MLW). This alternative would require approximately 1900 pilings. Alternative D-4(C) consists of a solid fill wharf with pile-supported bridges.

## IV. IMPACTS ASSOCIATED WITH THE PROPOSED ALTERNATIVES

**Alternative D-1**

* Alternative D-1 would fill 18 acres of freshwater wetland. A total of 3150 feet of streams and three to four vernal pools would be filled. Some of this impact has already occurred: MDOT filled 1.6 acres of scrub-shrub swamp for the access road on Kidder Point pursuant to the 1988 permit. MDOT also

filled approximately 10 acres of freshwater wetlands, three vernal pools (FHWA and MDOT 1995), and a stream in 1985 without first obtaining a Section 404 permit. Many more acres of wetlands will be indirectly impacted by this alternative (see section on "Indirect Impacts" for additional information).

* Alternative D-1 would directly fill 16.2 acres of intertidal habitat and 18.3 acres of subtidal habitat. A total of 36 acres of eelgrass would be permanently lost. Up to an additional 250 acres of eelgrass habitat could be adversely affected by this alternative.[8] This alternative would also result in the alteration of 45.8 acres of subtidal habitat due to dredging, and short term benthic impacts due to dredged material disposal at the Rockland disposal site.[9] Some of these impacts have already occurred (MDOT filled 3.7 acres of intertidal habitat during construction of the Sears Island causeway and dredged 29 acres of subtidal habitat).

**Alternative D-1.1**

* Alternative D-1.1 would fill a total of 17 acres of freshwater wetland, three to four vernal pools, and 3090 feet of stream. Indirect impacts would be substantial.

* Alternative D-1.1 would directly fill 16.2 acres of intertidal habitat and 18.3 acres of subtidal habitat. A total of 36 acres of eelgrass would be permanently lost. An additional 250 acres of eelgrass could be adversely affected by this alternative. This alternative would also result in the alteration of 45.8 acres of subtidal habitat due to dredging.

**Alternative D-2(A)**

* Alternative D-2(A) would result in the loss of 25.5 acres of freshwater wetlands, 3125 feet of stream, and three to four vernal pools. Indirect impacts would be substantial.

* Alternative D-2(A) would directly fill 16 acres of intertidal habitat and 12.1 acres of subtidal habitat. Approximately 13.4 acres of eelgrass would be permanently lost, and an additional 80 acres could be adversely affected. This alternative would also result in the alteration of 33.7 acres of subtidal habitat due to dredging.

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[8] These adverse effects consist of "reduced productivity" of eelgrass (i.e., loss of 30% to 84% of eelgrass plants in a bed).

[9] Pending the outcome of additional testing, the Rockland disposal site would likely be used for dredged material disposal.

**Alternatives D-2(B) and (C)**

* Alternatives D-2(B) and D-2(C) would result in the loss of 25.5 acres of freshwater wetlands, 3125 feet of stream, and three to four vernal pools. Indirect impacts would be substantial.

* Alternatives D-2(B) and D-2(C) would directly fill approximately 16 acres of intertidal habitat and 11.5 acres of subtidal habitat. Approximately 13.7 acres of eelgrass would be permanently lost, and an additional 80 acres could be adversely affected. This alternative would also result in the alteration of 33.7 acres of subtidal habitat due to dredging.

**Alternative D-2(D)**

* Alternative D-2(D) would result in the loss of 25.5 acres of freshwater wetlands, 3125 feet of stream, and three to four vernal pools. Indirect impacts would be substantial.

* Alternative D-2(D) would directly fill 16.1 acres of intertidal habitat. Over 1900 pilings would be placed in 0.2 acres of subtidal habitat. Approximately 13.5 acres of eelgrass would be permanently lost, and an additional 120 acres could be adversely affected. This alternative would also result in the alteration of 33.7 acres of subtidal habitat due to dredging.

**Alternatives D-2.1(A)**

* Alternative D-2.1(A) would result in the loss of 20 acres of freshwater wetlands, 3105 feet of stream, and three to four vernal pools. Indirect impacts would be substantial.

* Alternative D-2.1(A) would directly fill 16 acres of intertidal habitat and 12.1 acres of subtidal habitat. Approximately 13.4 acres of eelgrass would be permanently lost, and an additional 80 acres could be adversely affected. This alternative would also result in the alteration of 33.7 acres of subtidal habitat due to dredging.

**Alternatives D-2.1(B) and (C)**

* Alternatives D-2.1(B) and D-2.1(C) would result in the loss of 20 acres of freshwater wetlands, 3105 feet of stream, and three to four vernal pools. Indirect impacts would be substantial.

* Alternatives D-2.1(B) and D-2.1(C) would directly fill approximately 16 acres of intertidal habitat and 11.5 acres of subtidal habitat. Approximately 13.7 acres of eelgrass would be permanently lost, and an additional 80 acres could be adversely affected. This alternative would also result in the alteration of 33.7 acres of subtidal habitat due to dredging.

**Alternative D-2.1(D)**

* Alternative D-2.1(D) would result in the loss of 20 acres of freshwater wetlands, 3105 feet of stream, and three to four vernal pools. Indirect impacts would be substantial.

* Alternative D-2.1(D) would directly fill 16.1 acres of intertidal habitat. Over 1900 pilings would be placed in 0.2 acres of subtidal habitat. Approximately 13.5 acres of eelgrass would be permanently lost, and an additional 120 acres could be adversely affected. This alternative would also result in the alteration of 33.7 acres of subtidal habitat due to dredging.

**Alternative D-4(A)**

* Alternative D-4(A) would result in the loss of 28.4 acres of freshwater wetlands, 5125 feet of stream, and three to four vernal pools. Indirect impacts would be substantial.

* Alternative D-4(A) would directly fill 16.1 acres of intertidal habitat. Over 1900 pilings would be placed in 0.2 acres of subtidal habitat. Approximately 13.5 acres of eelgrass would be permanently lost, and an additional 120 acres could be adversely affected. This alternative would also result in the alteration of 33.7 acres of subtidal habitat due to dredging.

**Alternatives D-4(C)**

* Alternative D-4(C) would result in the loss of 28.4 acres of freshwater wetlands, 5125 feet of stream, and three to four vernal pools. Indirect impacts would be substantial.

* Alternative D-4(C) would directly fill 16 acres of intertidal habitat and 12.1 acres of subtidal habitat. Approximately 13.4 acres of eelgrass would be permanently lost, and an additional 80 acres could be adversely affected. This alternative would also result in the alteration of 33.7 acres of subtidal habitat due to dredging.

## V. <u>CONSIDERATION OF IMPACTS DESCRIBED IN THE 404(b)(1) GUIDELINES</u>

**Physical and Chemical Characteristics of the Aquatic Ecosystem**

**1. Substrate impacts**

Intertidal and subtidal filling due to the project would eliminate water circulation over 16.3 to 34.4 acres of substrate (depending on the alternative). Construction of the Sears Island causeway has already changed water circulation and current patterns by blocking tidal exchange between Long Cove and Stockton Harbor. Benthic invertebrates (soft shell clams, blue mussels, marine worms, etc.) and 3.7 acres of their habitat at the causeway site were destroyed. Benthic populations and habitat would be similarly destroyed at the terminal site. Localized sedimentation patterns have changed as a result of causeway construction. Localized hydrography would also change in the area surrounding the wharf, pilings, and associated structures at the terminal site (NAI 1995b).

**2. Suspended particulates/turbidity impacts**

Suspended particulates and turbidity due to dredging, filling, driving piles, building bulkheads, etc. would reduce light penetration through the water column during construction. This would reduce photosynthetic efficiency for eelgrass, which depends on good water clarity, and could cause eelgrass beds to be smothered as suspended sediments settle out of the water column (Kenworthy and Haunert 1991).

During port operations, propeller wash from cargo ships, tug boats, and support vessels would resuspend the fine silty-sand sediments which are predominant in the terminal area, elevating turbidity levels and decreasing water quality. Sight-feeding fishes, seals, and waterfowl would likely avoid the area during periods of elevated turbidity. Eelgrass beds in the surrounding areas (i.e., those not destroyed by construction) would be subject to long term stress from frequent decreased water clarity, likely resulting in the loss of nearby beds and decreased vegetative density and productivity in beds farther from the terminal site (NAI 1995b).

**3. Water column impacts**

The elimination of eelgrass beds due to port construction and operations would remove a resource which is capable of filtering pollutants and removing nutrients from the water column (Kenworthy et al. 1982). Additionally, ambient water quality would decrease during port operations due to chemical contamination from runoff, machinery oil and grease, and other pollutants.

**4. Alteration of current patterns and water circulation**

Construction and maintenance of the Sears Island causeway has disrupted current patterns and water circulation by creating a physical barrier to tidal exchange between Long Cove and Stockton Harbor, and by eliminating water circulation over the 3.7 acre tidal bar itself. Construction and maintenance of a large marginal wharf on the western shore of Sears Island would alter localized hydrography in several ways (NAI 1995b).

Under Alternative D-1 (the solid fill alternative), littoral sediment transport would be blocked by the wharf. Water circulation would be eliminated over the 30.1 acres of intertidal and subtidal bottom filled for the port. Wave reflection off the wharf structure would modify current patterns and increase aggregate wave energy adjacent to the port facility, particularly on the southern side of the port, creating back eddies extending over 250 acres of eelgrass habitat (NAI 1995b).

Under Alternatives D-2(B), D-2(C), D-2.1(B), and D-2.1(C), littoral sediment transport would be blocked by the wharf "island"

and solid fill northern bridge. Sedimentation would occur on either side of the solid bridge. Wrack, trash, and debris would likely accumulate due to poor circulation in the basin immediately shoreward of the wharf "island," and would limit the use of this area by aquatic organisms. Piles supporting the southern bridge to the wharf "island" would provide a focal point for scouring. Water circulation would be eliminated over the 23.3 acres of intertidal and subtidal bottom filled for the port. Wave reflection off the wharf "island" and off the margins of the cargo area would modify current patterns and increase aggregate wave energy adjacent to the port facility, particularly on the southern side of the port, creating back eddies extending over 80 acres of eelgrass habitat (NAI 1995b).

Under Alternatives D-2(A), D-2.1(A), and D-4(C), littoral sediment transport would be blocked by the solid fill wharf structure, and water circulation would be eliminated over 24.0 acres of intertidal and subtidal bottom. The presence of the structure would create back eddies extending over 80 acres of eelgrass habitat (NAI 1995b).

Alternative D-2(D), D-2.1(D), and D-4(A) would fill 12.2 acres of intertidal and subtidal bottom, eliminating water circulation over that area and creating a structure that would modify current patterns, forming back eddies extending over 120 acres of eelgrass habitat (NAI 1995b).

**Biological Characteristics of the Aquatic Ecosystem**

**1. Threatened and Endangered Species Impacts**

Loss of songbird habitat did and would result in a reduced prey base for peregrine falcons, a federally endangered species, which hunt along the shoreline during migration. The USFWS has determined that the proposed project would also disrupt feeding and perching bald eagles, and may preclude bald eagles from nesting on the island in the future. Moreover, past and proposed wetland filling on Sears Island alone (i.e., not including the filling on Kidder Point) would result in the loss of between 15.5 and 26.8 acres of forested and scrub-shrub wetlands that provide suitable habitat for the southern bog lemming (state watch list) and eastern ribbon snake (state special concern list).

**2. Aquatic Food Web Impacts**

Wetland filling and loss of stream habitat did and would result in the loss of habitat for numerous species of insects, worms, and freshwater mollusks which are all critical components of the food web on Sears Island. This loss of habitat did and would reduce the overall prey base available on the island, and result in the death of more sedentary wetland species (e.g., worms, snails, clams, salamanders, frogs, snakes, and small mammals) that cannot relocate when filling occurs. These animals provide food for game birds, song birds, raptors, and mammals.

Construction of the Sears Island causeway destroyed resident populations of mollusks (soft shell clams and blue mussels), crabs, benthic microinvertebrates, fucoid algae, and marine worms on the 3.7 acre tidal bar, as well as the habitat on which these organisms depended for their survival. Since the habitat was lost, it cannot be recolonized by organisms from surrounding areas. The habitat and its important food chain resources are no longer available for foraging by green crabs, rock crabs, lobsters, winter flounder, menhaden, pollack, Atlantic salmon, and other species of fish, shorebirds, waterfowl and crustaceans.

Intertidal fill for construction of the cargo terminal would destroy resident populations of clams, mussels, crabs, periwinkles, benthic microinvertebrates, fucoid algae, and marine worms living at the terminal site, and would eliminate up to 12.1 acres of habitat for these species. Because the habitat would be eliminated, it could not be recolonized. The food web support from this area would no longer be available for foraging crustaceans, fish, or birds.

Subtidal fill for construction of the cargo terminal would destroy resident populations of sand dollars, dog whelks, starfish, sea cucumbers, sea urchins, lobsters, hermit crabs, sand shrimp, and other species, as well as 0.2 to 18.3 acres of the habitat on which these species depend. A large area of eelgrass habitat would be destroyed, eliminating an extremely valuable nursery, shelter, and feeding habitat for a wide variety of fish and shellfish species (e.g., tomcod, silversides, pipefish, and lobster), many of which eventually become food resources for larger aquatic organisms including commercially important finfish.

Dredging associated with the facility has already altered 29 acres of valuable subtidal soft bottom habitat, and destroyed any sessile aquatic organisms in the affected area at the time the dredging occurred. An additional 4.7 to 16.8 acres of subtidal soft bottom would be altered by the full project, and sessile organisms in this area would also be destroyed. Water clarity impacts and sedimentation from the additional dredging would also result in indirect degradation and loss of eelgrass habitat, with associated consequences for the marine food web (NAI 1995b).

Dredged material disposal from the work already completed involved dumping 600,000 cubic yards of material at the Rockland disposal site in West Penobscot Bay, resulting in the destruction of any aquatic organisms inhabiting the site at the time. An additional 52,000 to 443,000 cubic yards of material would be dumped for the full project, smothering any aquatic organisms which have colonized the site, potentially including lobsters, scallops, spider crabs, and polychaetes. In addition, maintenance dredging would add another 7,400 to 38,300 cubic yards of dredged material.

Port operations would increase the level of human activity, noise, and vessel traffic in the area, resulting in habitat disturbance for finfish, crustaceans, and marine mammals, and leading to reduced faunal utilization of remaining habitats in the project area. Water quality impacts from port operations would result in habitat degradation for all aquatic species.

### 3. Other Wildlife Impacts

The loss of at least 17 acres of freshwater forested and scrub-shrub wetlands, vernal pools, and several intermittent streams would diminish breeding and nesting habitat, escape cover, travel corridors, and food sources for a variety of resident and migratory wildlife species. The existing fill at the terminal site already destroyed 9 acres of wildlife habitat and caused indirect impacts by fragmenting the largest freshwater wetland on Sears Island; the additional fill proposed by MDOT would reduce the amount of habitat available even further. This loss adversely affects many species of songbirds, raptors, game birds; mammals, reptiles, and amphibians.

At least one vernal pool would be filled by the proposed terminal, and an estimated three others have already been filled by the unauthorized filling activity. Because of the limited home ranges, traditional migration routes, longevity and philopatry (i.e., dedication to the natal pool) of some vernal pool amphibians, the loss of vernal pools can devastate a population.[10] In addition, amphibians would suffer a loss of nonbreeding habitat in the forested wetlands surrounding the pools.

Construction activities also filled one of the two largest streams on Sears Island. This stream likely provided habitat for a number of aquatic insects, crustaceans, mollusks, and amphibians, which in turn formed a prey base for birds, mammals, reptiles, and amphibians. In addition, this stream once supplied nutrients to Penobscot Bay; the nutrients currently flow into detention basins.

The diversity of cover types available within wetland N-1 provides nesting, perching and feeding habitat for avian species that use herbaceous, shrub, and canopy layers within a forest habitat. The veery and woodthrush, both neotropical migrants which are experiencing population declines, prefer forested wetlands and would find suitable habitat in N-1. These species, as well as other migratory and resident songbirds, raptors, and American woodcock, would lose valuable habitat in addition to that which has already been lost.[11]

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[10] Some salamanders and frogs are laying eggs in the detention basins that have replaced the vernal pools in the terminal area. These individuals likely stumbled across the basins when searching for the pools that had been destroyed. However, it is unknown whether these egg masses are surviving, and it is unlikely that the detention basins provide adequate habitat for developing larvae.

[11] Impacts to some bird species extend beyond the obvious loss of wetland habitat. By fragmenting wetland N-1 and the wetland directly to the south (wetland S-1), clearing and filling the terminal area rendered roughly 30 acres of the remaining wetland habitat less suitable as nesting habitat for those species sensitive to disturbance (e.g., neotropical migrants), and those species which require large tracts of contiguous habitat (e.g., forest interior species, such as the barred owl, veery, and brown

Wetland filling did and would also result in the loss of feeding, breeding, and escape habitat for many mammal species, including masked shrew, meadow vole, mink, northern short-tailed shrew, southern red-backed vole, white-tail deer, and long-tailed weasel (see USFWS Evaluation, p. 8).

Operation of the terminal, rail, and use of the access road would also result in indirect impacts to the remaining freshwater wetlands. Specifically, the access road would create obstacles to migrating herptiles, and contribute to mortality of breeding amphibians. In addition, noise and lights emanating from the terminal, road, and rail would render additional habitat less suitable for many sensitive species (see expanded discussion of indirect impacts below).

Therefore, the proposed project would result in a total loss of at least 17 acres of freshwater wetlands and severe indirect impacts; the filling that has already occurred resulted in the loss of high value wildlife habitat, and the proposed fill will result in additional loss of valuable habitat. This loss, in turn, would likely lead to a decrease in biodiversity, ecological stability and productivity of the island ecosystem.

Construction and operation of the cargo terminal would result in habitat disturbance (increased noise, vessel traffic, etc.) for harbor seals swimming and feeding north of their haulout on Sears Island ledge. As an indirect effect of habitat loss for finfish, prey availability for seals could decrease in the immediate area of the port.

Habitat loss for finfish, crustaceans, and mollusks would also result in a reduced prey base for numerous bird species including osprey, bald eagle, great blue heron, common loon, greater scaup, bufflehead, red-breasted merganser, and common eider.

**4. Ecosystem diversity**

There are several recognized benefits associated with preserving biodiversity, including possible economic values, evolutionary potential, aesthetic or ethical reasons, and maintenance of ecosystem integrity. The array of valuable habitats on Sears Island (i.e., forested and scrub-shrub wetlands, streams, vernal pools, salt marsh, rocky intertidal areas, mud flats, eelgrass beds, and subtidal habitat) contribute to the high biodiversity of flora and fauna observed on and around the island. In September of 1990, EPA's Science Advisory Board (SAB) urged the agency to "attach as much importance to reducing ecological risk as it does to reducing human health risk." Specifically, SAB listed habitat alteration and overall loss of biodiversity as two of the areas of most concern. The primary threat to biodiversity is direct loss of habitat and fragmentation of ecosystems, both of

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creeper). In fact, MDOT's consultant found that wetlands N-1 and S-1 currently provide the largest tract of forest interior on the island; prior to the illegal filling, the wetlands provided an even larger tract of forest interior (NAI 1995c).

which would occur on Sears Island if the port is built as proposed. Other entities have also recognized the importance of preserving biodiversity: the World Resources Institute, the World Conservation Union, and the United Nations Environment Programme recently urged national regulators to reform policies that result in the degradation and loss of biodiversity in coastal, marine, and freshwater ecosystems.

The Council on Environmental Quality (CEQ) has stated that neither public lands nor protected areas (i.e., parks and wilderness areas) can by themselves maintain biodiversity in the United States. It is therefore crucial for federal agencies to consider biodiversity in its decision making processes. In this case, Sears Island has a remarkable array of rare species, birds, mammals, and marine fauna that appears uncommon in Penobscot Bay. It is not possible to definitively list species that would be extirpated from Sears Island by construction of the proposed port but they may include area sensitive or human sensitive species such as black bear, moose, southern bog lemming, bald eagle, peregrine falcon, and spotted sandpiper, and marine species such as bay pipefish, seahorse, and grubby.

**Special Aquatic Sites**

**1. Impacts on Wetlands**

Alternative D-1 would result in the direct loss of 18.2 acres of freshwater wetlands, a special aquatic site under the Section 404(b)(1) guidelines. Alternative D-1.1 would result in the direct loss of 17.1 acres of wetlands; alternatives D-2(A) through (D) would result in the direct loss of 25.5 acres of wetlands; D-2.1(A) through (D) would result in the direct loss of 20 acres of freshwater wetlands, and; alternatives D-4(A) and (C) would result in the direct loss of 28.4 acres. Because wetland N-1 provides groundwater discharge and water quality protection (including sediment/toxicant retention and nutrient removal/transformation), the proposed terminal would result in the direct loss of these functions. Although there is not presently a high opportunity for the water quality functions to operate, these functions would become important if development occurred. Moreover, the destruction of wetland vegetation would reduce wetland N-1's productivity (i.e., reduce the amount of energy available to organisms in the aquatic ecosystem food chain). Nine acres of wetlands adjacent to N-1 providing these functions were already lost due to the unauthorized filling activity.

**2. Impacts on Mud Flats**

Creation of the Sears Island causeway destroyed 3.7 acres of valuable intertidal habitat, eliminating associated habitat functions such as primary biological productivity and food chain support. Approximately 1.5 acres of the intertidal bar was highly productive clam flats. Compensatory mitigation which was performed to offset this loss has failed, as evidenced by a steady decline in the clam population of all three created flats since 1990. Also, the mitigation sites were created by filling existing valuable intertidal and subtidal habitats; therefore, the mitigation effort has resulted in a net loss of marine habitats.

Construction of the cargo terminal would result in the destruction of an additional 12 acres of valuable intertidal habitat. Shellfish surveys in this area have documented standing crops of soft shell clams as high as 93.6 bushels per acre. These resources would be permanently lost, along with associated mud flat communities (periwinkles, blood worms, clam worms, ribbon worms, amphipods, algae, etc.) and the food chain support they provide for fish and crustaceans, waterfowl, wading birds, and shorebirds.

**3. Impacts on Vegetated Shallows**

The project would result in the permanent loss of at least 13.4 acres of eelgrass habitat. Because of the extreme sensitivity of eelgrass beds to localized environmental factors (e.g., good water quality and clarity, low wave energy, and adequate substrate), over 80 acres of eelgrass would be adversely affected due to indirect impacts from dredging and port construction.[12] Elevated turbidity and disruption of the substrate over this larger area from wave reflection, vessel wakes, propeller wash, and maintenance dredging make it unlikely that eelgrass would recolonize the subtidal area surrounding the port.

**Human Use**

**1. Impacts on Recreational and Commercial Fisheries**

The Sears Island port project would have a permanent adverse effect on numerous recreationally and commercially harvested species of fish, mollusks, and crustaceans, including destruction of fishing grounds and habitat for these species. The project would result in the direct loss of productive intertidal flats which could be harvested for clams and/or worms by commercial or recreational diggers. The flats at the terminal site in particular have supported soft shell clam densities far above commercially viable concentrations for harvesting. During field work for the SEIS, surveyors have noted lobster traps set directly in the proposed terminal area and seine boats for menhaden working in the area just offshore of the proposed port site. Additional recreationally and/or commercially important species which use the habitats that would be affected by the project for feeding, breeding, or shelter from predators include: blueback herring, Atlantic herring, alewife, American shad, white hake, windowpane flounder, winter flounder, mackerel, pollack, bluefish, Atlantic rock crab, and sea scallop. EPA and NMFS observed divers collecting sea urchins and sea scallops from the terminal area in October of 1993. In addition, USFWS has observed surf casters fishing off the jetty on several occasions, the most recent being

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[12] These indirect impacts could affect up to 250 acres of eelgrass (NAI 1995b).

July of 1995.

**2. Impacts on Recreation**

Hikers and birdwatchers use the forested wetlands on Sears Island. The access road on Sears Island provides easy access to wetland N-1, and hikers and picnickers often walk the beaches. The proposed terminal would result in a destruction of a large portion of N-1, would reduce the quality of the remaining habitat for sightseeing and birdwatching, and would restrict access to the forested areas.

**3. Impacts on Aesthetics**

Sears Island is the largest uninhabited island in Maine, and the thick forests and beaches along the western shore of the island can be seen from homes in Belfast, East Northport, and Bayside, and from Moose Point State Park. In addition, many pleasure boats sail around Penobscot Bay. The proposed cargo terminal would reduce the quality of the habitat for sightseeing and sailing, and reduce the aesthetic qualities of Penobscot Bay. Operation of the port would result in noise and possibly odors, thus further reducing the aesthetic qualities of the island (FHWA and MDOT 1995).

**Persistence and Permanence of Impacts**

While some impacts associated with construction of the terminal may be temporary, virtually all of the direct aquatic impacts associated with the proposed cargo terminal, and many of the indirect impacts, would be permanent.

**Indirect Impacts to Freshwater and Marine Habitats**[13]

All alternatives proposed by MDOT would result in substantial indirect impacts to the remaining freshwater wetland systems. Specifically, preliminary construction of the cargo terminal has fragmented a large, forested wetland system, and likely increased the rates of nest parasitism and predation on a number of avian species, including jeopardized neotropical migrants. In fact, USFWS estimates that a zone of approximately 200 meters around a cleared or developed area will be unsuitable or less suitable as breeding habitat for forest interior species. Therefore, the wildlife impacts associated with the cargo terminal extend beyond the direct footprint of the fill. Disturbances from construction and operation of the cargo terminal would also substantially reduce the likelihood of future use of Sears Island as a nesting site for the bald eagle, and would reduce use by eagles that now forage in

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[13] For purposes of this attachment, indirect impacts are defined as those impacts that extend beyond the direct footprint of the fill and result from the discharge of dredged or fill material. Examples of indirect impacts include, but are not limited to, fragmentation of terrestrial habitat, shading of marine habitat, and increased turbidity.

the waters around the island but nest elsewhere. In addition, the proposed development on Sears Island would virtually surround the entire northwest quadrant of the island. Thus, the approximately 200+ acres on this section of the island would be unsuitable or far less suitable for many wildlife species.

Construction of the access road has created migratory obstacles to amphibians and reptiles in N-1, some of which use established migratory routes to reach breeding pools (e.g., spotted salamanders). In fact, adult spotted salamanders were found dead on the access road during the 1992 breeding season. Moreover, additional filling at the terminal site would further impede movement of amphibians.

Operation of the terminal (e.g., cargo cranes, railroad activities, and boat signals) would result in 80 to high 90s decibels of noise at peak operating capacity; additional noise would emanate from the access road through the center of the island (FHWA and MDOT 1995). This noise will likely render much of the remaining wetland habitat on the island less suitable for wildlife, particularly for sensitive forest interior species and for species that utilize vocalizations for territorial protection and breeding. Lights at the terminal may also disrupt nocturnal wildlife and cause some individuals to avoid the area around the terminal.

Finally, water quality in some of the wetlands could be degraded due to runoff from the roads, trucks, machinery, stockpiled cargoes, and buildings. This reduction in water quality could in turn reduce the quality of the habitat for wildlife.

Operation of the port would resuspend sediments and increase turbidity. As discussed above, this turbidity would likely impact sight-feeding fish and wildlife, and would decrease remaining eelgrass density and productivity. Ambient water quality would also decrease due to chemical contamination from runoff and other pollutants. Finally, operation of the port would also result in increased vessel traffic and noise, which in turn would reduce the value of the marine habitat for a variety of faunal species.

<u>**Secondary Freshwater Impacts Associated with the Proposed Project**</u>

The causeway associated with the proposed port provides access to a once undeveloped island. MDOT proposes to reserve the northwest quadrant of the island for the construction of an industrial park approximately 50 acres in size. Given the upland/wetland mosaic existing on the island and in the northwest quadrant, it would be difficult for any future development to avoid the freshwater wetlands entirely. This industrial park could therefore result in additional direct and indirect freshwater wetland impacts.

<u>**Cumulative Effects on the Aquatic Ecosystem**</u>

The aquatic ecosystem in the vicinity of Sears Island is affected by the existing port facility at Mack Point, runoff from the General Alum & Chemical site, local sewage treatment practices, and local fishing efforts (FHWA and MDOT 1995). A 268 slip marina, boat yard, and yacht club with 150 single point moorings has been permitted for construction in Stockton Harbor approximately one-quarter mile from Sears Island (ACOE 1993). Although the facility was designed to limit impacts to eelgrass, the additional recreational boating activity could adversely affect wildlife and marine flora and fauna (FHWA and MDOT 1995).

Eelgrass in Penobscot Bay grows only to a maximum depth of 10 feet MLW (Short 1995), whereas eelgrass in Casco Bay and in other areas of the Gulf of Maine grows to depths of 15 feet MLW or more (Kurland 1994). This suggests that current eelgrass distribution in Penobscot Bay has greatly diminished over its historic range due to poor water clarity. Moreover, given the small amount of existing eelgrass in Penobscot Bay relative to the amount of suitable eelgrass habitat in the bay, it is clear that the proposed project would contribute to the cumulative losses in the region.

Large blocks of forest adjacent to the shorefront such as those found on Sears Island are also uncommon in Penobscot Bay (FHWA and MDOT 1995). Fragmentation of the large forested tract found on the central western shore of Sears Island would further diminish the presence of this relatively rare habitat in the bay area. In addition, according to information from EPA's GIS office, there are only three other relatively undeveloped Maine islands larger than 250 acres in size with flora similar to that of Sears Island. Therefore, the placement of a port facility and industrial park on Sears Island would contribute to the cumulative losses of these large, coastal habitats.

In summary, the proposed Sears Island cargo terminal would contribute to cumulative effects on the aquatic ecosystem by destroying and degrading large areas of freshwater and marine habitat.

## V. EVALUATION OF 230.10(c) FACTORS

The four factors listed below individually and collectively are used to determine whether a proposed project would cause or contribute to significant degradation of waters of the United States. The analysis below is supported by the consideration of Subparts C through F of the Section 404(b)(1) guidelines.

### Section 230.10(c)(1)

The proposed project would result in substantial permanent adverse effects on human health or welfare, which is defined to include persistent effects on fish, shellfish, wildlife and special aquatic sites. A minimum of 17.1 acres of freshwater wetlands would be destroyed, between 13.4 and 35.9 acres of eelgrass would be permanently lost, and severe impacts to mudflats and clamflats would occur. These resources provide important habitat for numerous species of birds, mammals, reptiles, amphibians, and commercially valuable fish and shellfish. Indirect and secondary effects would cause further degradation of these resources. The permanent loss of at least 13 acres of eelgrass, and the degradation of up to an additional 80 to 250 acres dwarfs any project reviewed in recent times; no projects permitted in at least the past decade in New England have resulted in this magnitude of loss to submerged aquatic vegetation.

Section 230.10(c)(2)

The proposed project would result in substantial permanent adverse effects on life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including dozens of species of fish, shellfish, invertebrates, amphibians, reptiles, mammals and birds. The project environs provides habitat for 21 state and federally listed wildlife species. Combined effects total roughly 85 to 130 acres of loss of aquatic habitat which provide important functions for the above species such as feeding, breeding, nursery, and cover habitat. Degradation of additional habitat would extend beyond the footprint of fill through sediment transport, habitat fragmentation, altered hydrography, noise, light, pollutant runoff, vessel operations and other indirect impacts.

Section 230.10(c)(3)

The proposed project would result in substantial permanent adverse effects on aquatic ecosystem diversity, productivity and stability. Wetlands and eelgrass have been documented to be very high bioproduction areas. The wetlands and eelgrass on Sears Island are very large, high value resources. Impacts on these resources include loss of fish and wildlife habitats and the primary and secondary productivity associated with those habitats, as well as the loss of other non-habitat functions and values such as nutrient/toxicant retention, water quality enhancement, reduction of wave energy and protection against erosion.

Uniqueness or rarity of resources is not a prerequisite for finding impacts significant. Nevertheless, the biodiversity of habitat types and associated flora and fauna found on Sears Island is uncommon in Maine. The significant loss of ecological diversity, productivity, and stability that would occur on Sears Island supports a finding of significance.

The significant marine impacts are coupled with the direct loss of between 15 and 26 contiguous acres of valuable freshwater wetlands, roughly four vernal pools and almost two-thirds of a mile of stream. Indirect impacts would extend to a much larger portion of the island due to fragmentation and disturbances stemming from operation of the port. If permitted, the impacts to freshwater wetlands and waters alone in this case would be one of the most damaging to wildlife habitat in Maine over the past decade.

Section 230.10(c)(4)

The proposed project would result in permanent adverse effects on aesthetic values by introducing a major industrial facility onto the largest undeveloped island in Maine. The project site is visible from numerous vantage points in the area including Moose Point State Park, U.S. Route 1, Turtle Head Cove, and Belfast Bay.

Recreational values such as hiking, camping, fishing, and birdwatching on the northwest quadrant of the island would be severely restricted by the presence of a major port facility, access roadway, and railroad, as well as the potential future development of an industrial park. Preservation of the remainder of the island could maintain existing recreational opportunities in those areas, but recreational values would be compromised in at least a portion of the preservation land by noise, light, and/or other influences of the proposed port. Recreational fishing in the vicinity of the project for Atlantic mackerel, striped bass, Atlantic salmon, and other species (either from shore or by boat) could also be compromised as a result of habitat degradation and loss associated with the construction and operation of the project.

Economic values related to the commercial fishing industry would be adversely affected by displacing existing and potential commercial fisheries. Lobster gear in the proposed dredge and fill area would be permanently displaced. Menhaden seining off the existing stone jetty and into Long Cove could be curtailed as a result of conflicts with port operations. Soft shell clam habitat at the project site would be filled, precluding a future stock recovery to the commercially harvestable densities documented in the FEIS (FHWA and MDOT 1987). Historic scallop fishing near the project site could be affected by the loss of eelgrass habitat, since scallops can exhibit a marked habitat preference for eelgrass beds as a refuge from predators (Prescott 1990). Other commercial fisheries could also be affected by the loss of eelgrass meadows and other nursery habitats (Heck et al. 1995). These habitat effects are particularly noteworthy since the proposed project is unusual in terms of both the amount and quality of marine habitat that would be lost and degraded.

## VI. <u>MITIGATION</u>

Developing a mitigation plan for any of the twelve Sears Island alternatives portrayed in the DSEIS poses a formidable challenge. For a permit application to comply with the Section 404(b)(1) guidelines, the proposal must include all appropriate and practicable steps to compensate for unavoidable impacts. Where, as here, the adverse impacts in question are significant, the mitigation plan must also prevent or offset the environmental damage to an extent sufficient to comply with the section 230.10(c) of the guidelines (i.e., the impacts must no longer be significant). Whether a mitigation plan succeeds in sufficiently reducing significant impacts normally depends upon the extent to which it replaces or offsets the harm to the aquatic environment from the project. In this case, the types of aquatic habitats most severely damaged are forested wetlands, intertidal habitats, and eelgrass beds. It is technically difficult to restore or create these habitats successfully, let alone replicate the unusual juxtaposition of habitats that results in the high biodiversity on Sears Island.

For example, the hydrology of forested wetlands is quite complex and difficult to duplicate. It would take at least several years to be able to make an initial judgment about whether an attempt to restore or create a forested wetland is successful; to establish a fully functioning system could require a decade or more. Moreover, EPA and FWS do not know of any instances of successful vernal pool creation.

With respect to marine impacts, seagrass restoration has never been attempted in New England on the scale necessary to replace the eelgrass beds which would be destroyed and degraded by the proposed project. The only comparable experience with eelgrass creation in the Region is the experimental effort now underway in New Hampshire to compensate for the loss of a 1 acre eelgrass bed and 3 acres of potentially suitable eelgrass habitat associated with the New Hampshire Port Authority expansion project. The mitigation effort in New Hampshire thus far is a limited success but it is premature to determine whether the eelgrass beds will be self-sustaining in the long term. Based on the work of NMFS' Beaufort Laboratory in North Carolina (an internationally recognized leader in seagrass research, restoration, and creation), NMFS and EPA doubt that compensation for the approximately 13.4 to 35.9 acres of permanent eelgrass loss, let alone the potential adverse impacts to an additional 80 to 250 acres of eelgrass, is practicable.

MDOT's creation of clam flats in 1989 to compensate for intertidal habitat lost due to construction of the Sears Island causeway has not been successful, as evidenced by a decline in the clam population of all three flats since 1990. According to NMFS, this experience suggests that intertidal habitat creation has a high degree of uncertainty and cannot reasonably be expected to replicate the functions and values of the natural intertidal flats on Sears Island.

The agencies acknowledge the work done to date by MDOT and its consultants to identify potential mitigation sites and options for this project. Preservation of much of the remainder of Sears Island should effectively address concerns about secondary development on the island itself. However, preservation does not compensate for the direct and indirect impacts of the port project.

In light of this as well as the severity of the impacts, the difficulty of achieving functional replacement and the shortcomings of the current mitigation proposal, EPA is calling on the Corps and other knowledgeable parties to work with MDOT to evaluate prospects for developing a comprehensive mitigation plan that would adequately offset the harm caused by whatever becomes the final proposal. This effort should include not only examination of habitat creation and restoration efforts but consideration of any other approaches that would offset the lost functions and values that the project would cause.

VII. **CONCLUSION**

Mack Point Alternatives

The freshwater and marine habitats at Mack Point are clearly inferior to those found on Sears Island.[14] Specifically, the freshwater wetland systems on Mack Point are degraded by the adjacent industrial uses. In fact, the DSEIS states that "[m]ost terrestrial habitat at Mack Point is highly fragmented by development" (DSEIS, Volume 1, p. 2-85).

In addition, the type and quality of marine resources at Mack Point are dramatically different than the marine resources at Sears Island. Mack Point has much less diverse marine habitat, composed primarily of a small amount of rocky intertidal habitat, and larger areas of unvegetated intertidal and subtidal bottom. The quality of the unvegetated subtidal habitat has undoubtedly been diminished due to its proximity to the Searsport primary treatment wastewater discharge, and chronic exposure to vessel operations and occasional oil spills from the existing facility on Mack Point. NMFS has concluded that the marine habitat on Mack Point "... comprises a notably less diverse habitat assemblage than the intertidal and shallow subtidal zones at the proposed port location on the western shore of Sears Island" (NMFS 1993).

While the aquatic impacts associated with an expanded Mack Point facility would not be trivial, there is a marked difference in quality between aquatic resources at Mack Point and at Sears Island. If MDOT were to pursue a port facility at Mack Point, impacts to these aquatic resources would have to be minimized, and unavoidable impacts should be mitigated. However, a port facility at Mack Point with appropriate and practicable mitigation would not result in impacts sufficient to trigger the significant degradation provision of the Section 404(b)(1) guidelines.

Sears Island Alternatives

The Sears Island dry cargo terminal as proposed would irreparably harm the aquatic environment because of both the large size of the fill and the high quality of affected habitat. NMFS, FWS and EPA have intensively studied and documented the environmental characteristics of Sears Island and the adverse impacts that would occur from the port proposal. All three federal environmental agencies believe that the impacts associated with a Sears Island port facility would cause significant degradation of waters of the United States.

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[14] The freshwater and marine resources that existed at Mack Point prior to its development were likely similar to those currently found at Sears Island. The Mack Point port development resulted in direct and indirect impacts that dramatically reduced the functions and values of the aquatic resources there. Thus, if the proposed cargo port is constructed on Sears Island, the existing valuable habitats are liable to degrade in a similar fashion.

The environmental damage caused by the Sears Island project exceeds or equals that of most other projects proposed in New England where the resource agencies have found the impacts significant. In order to satisfy the Section 404(b)(1) guidelines, MDOT would have to offset the lost functions and values of the filled wetlands and waters such that the impacts were no longer significant. The current conceptual mitigation plan does not adequately meet this test.

In light of the foregoing, the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and U.S. Environmental Protection Agency believe that the alternatives portrayed in the DSEIS for the marine cargo terminal at Sears Island would cause or contribute to significant degradation in violation of Section 230.10(c) of the 404(b)(1) guidelines. We believe the facts of the case and the detailed analysis provided by our agencies should compel the Corps to reach the same conclusion.

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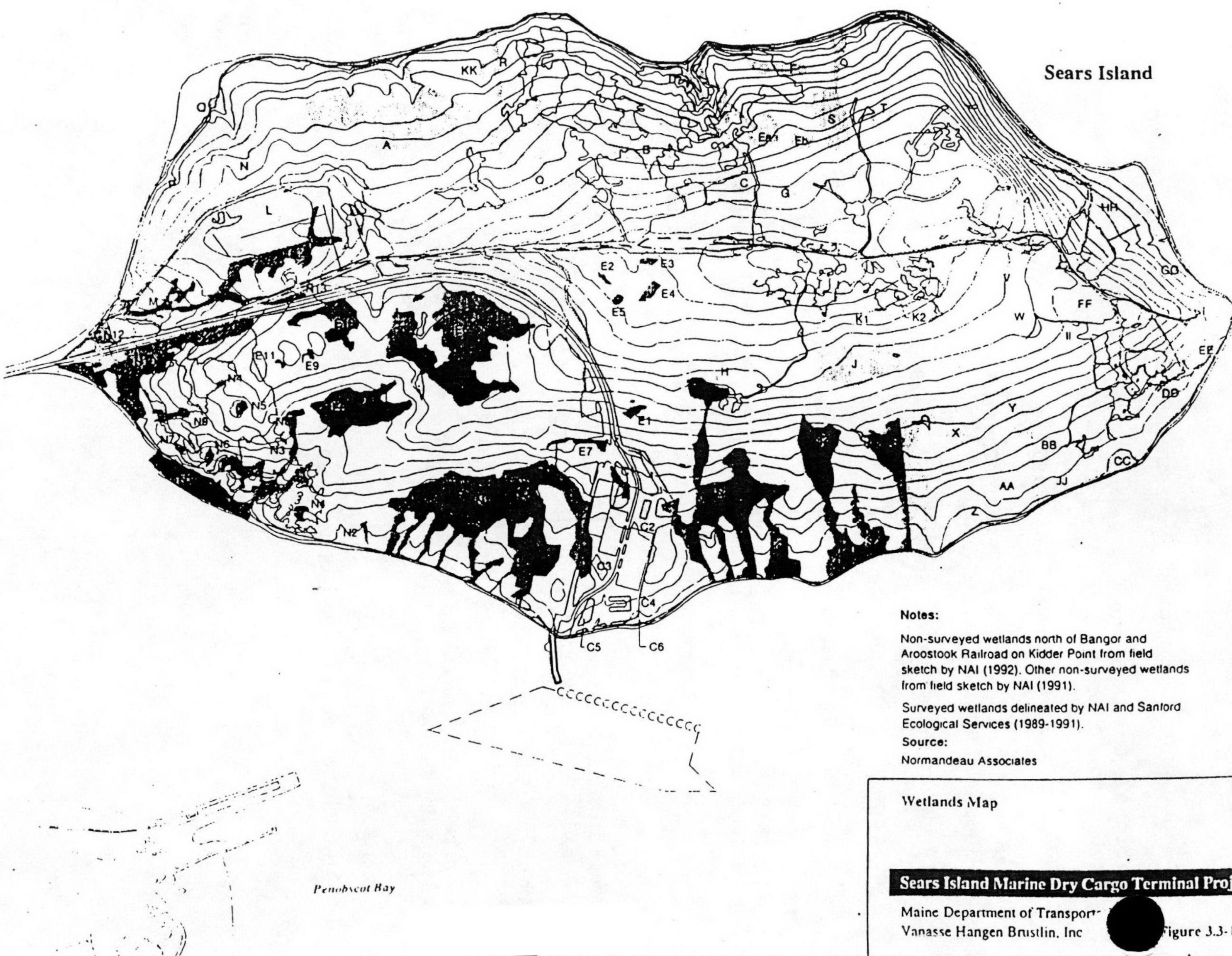
FIGURE 1




**Notes:**

Non-surveyed wetlands north of Bangor and Aroostook Railroad on Kidder Point from field sketch by NAI (1992). Other non-surveyed wetlands from field sketch by NAI (1991).

Surveyed wetlands delineated by NAI and Sanford Ecological Services (1989-1991).

**Source:**

Normandeau Associates

Wetlands Map

**Sears Island Marine Dry Cargo Terminal Project**

Maine Department of Transport

Vanasse Hangen Brustlin, Inc

Figure 3.3-1

FIGURE 2

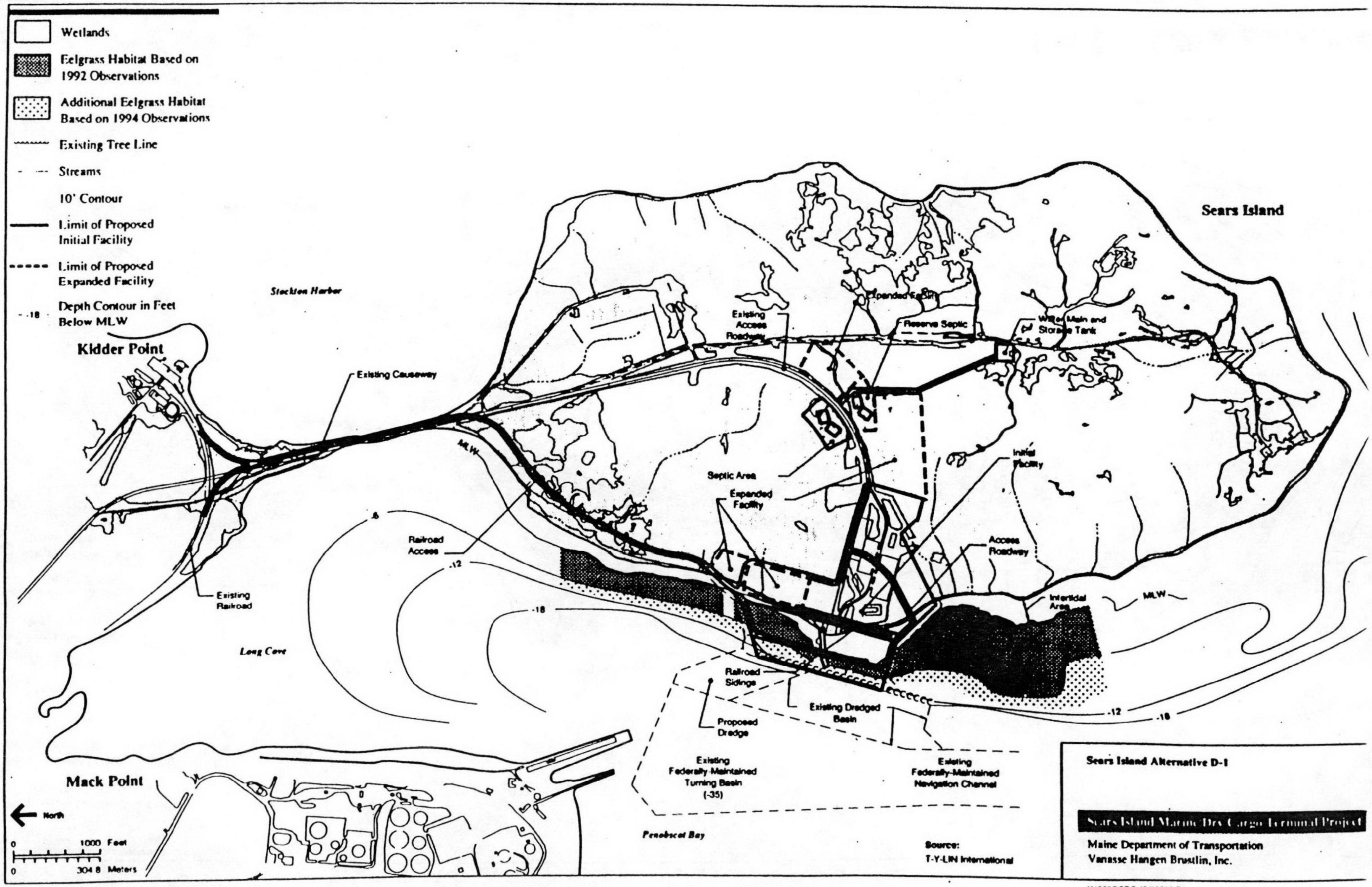



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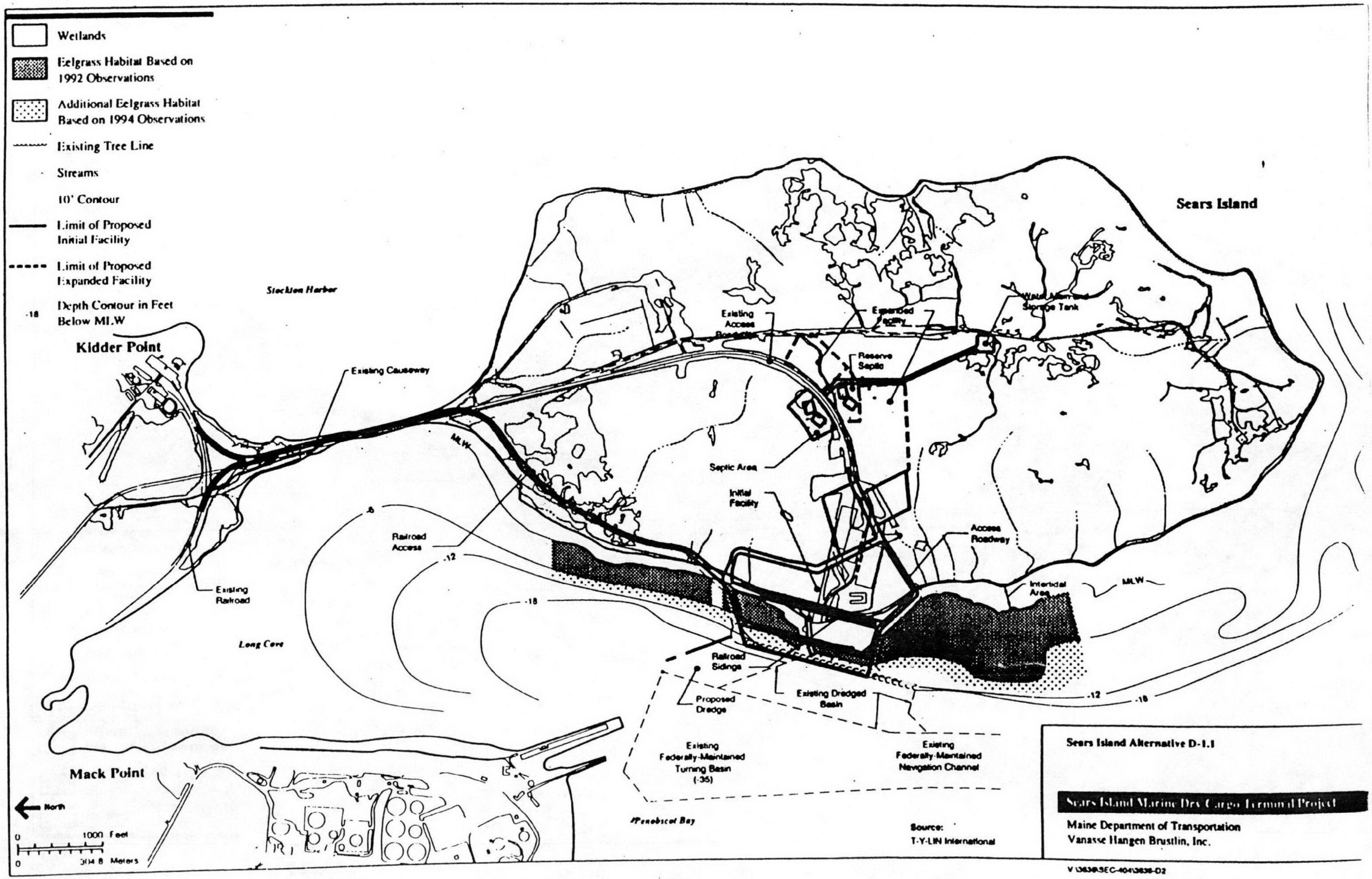
FIGURE 3



Wetlands
Eelgrass Habitat Based on 1992 Observations
Additional Eelgrass Habitat Based on 1994 Observations
Existing Tree Line
Streams
10' Contour
Limit of Proposed Initial Facility
Limit of Proposed Expanded Facility
Depth Contour in Feet Below MLW
-18
Kidder Point
Stockton Harbor
Sears Island
Existing Causeway
Existing Access Roadway
Expanded Facility
Reserve Septic
Septic Area
Initial Facility
Railroad Access
Access Roadway
Existing Railroad
Long Cove
Railroad Sidings
Proposed Dredge
Existing Dredged Basin
Intertidal Area
MLW
Existing Federally-Maintained Turning Basin (-35)
Existing Federally-Maintained Navigation Channel
Mack Point
North
0 1000 Feet
0 304.8 Meters
Penobscot Bay
Source: T-Y-LIN International
Sears Island Alternative D-1.1
Sears Island Marine Dry Cargo Terminal Project
Maine Department of Transportation
Vanasse Hangen Brustlin, Inc.

FIGURE 4

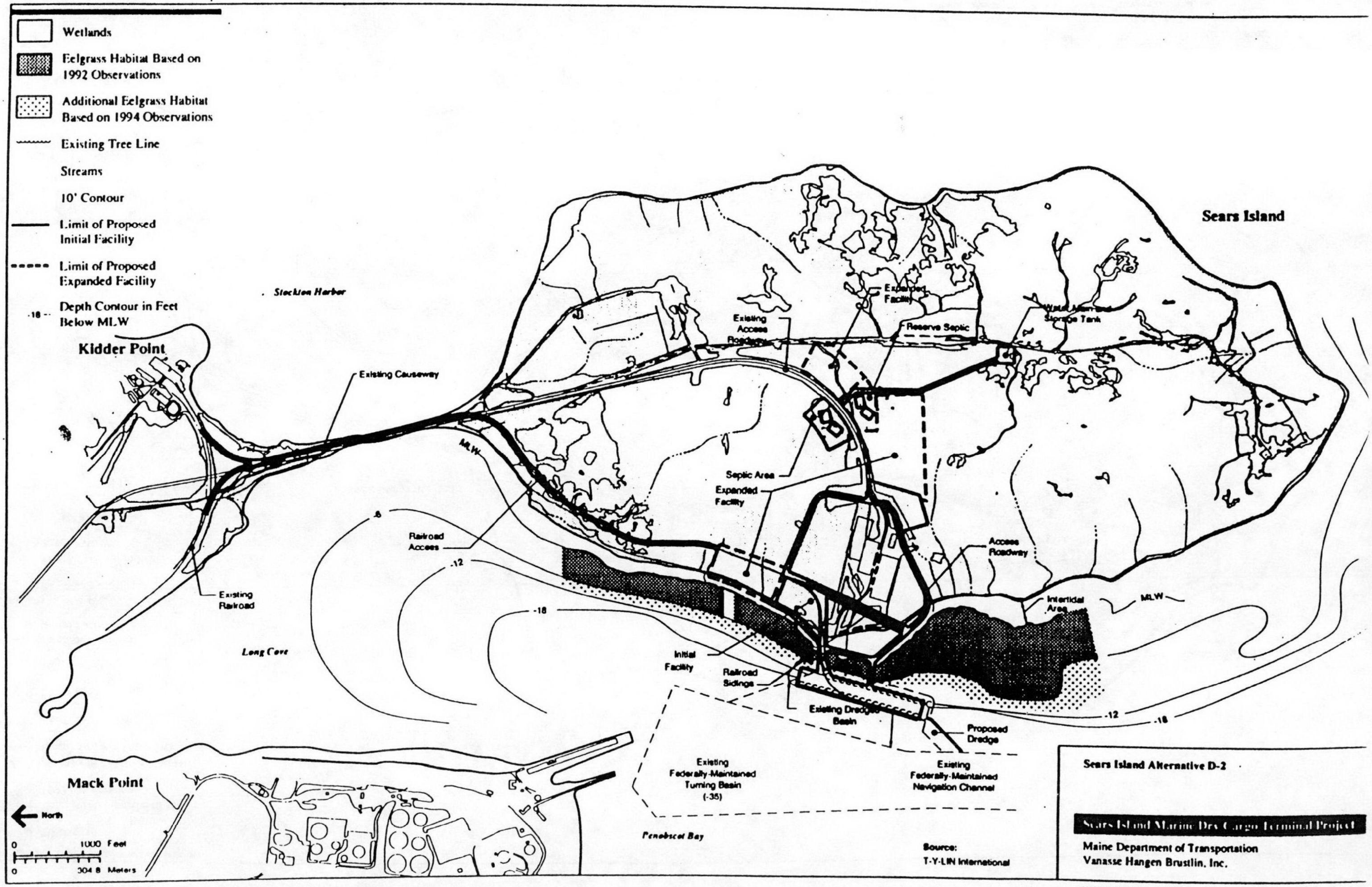



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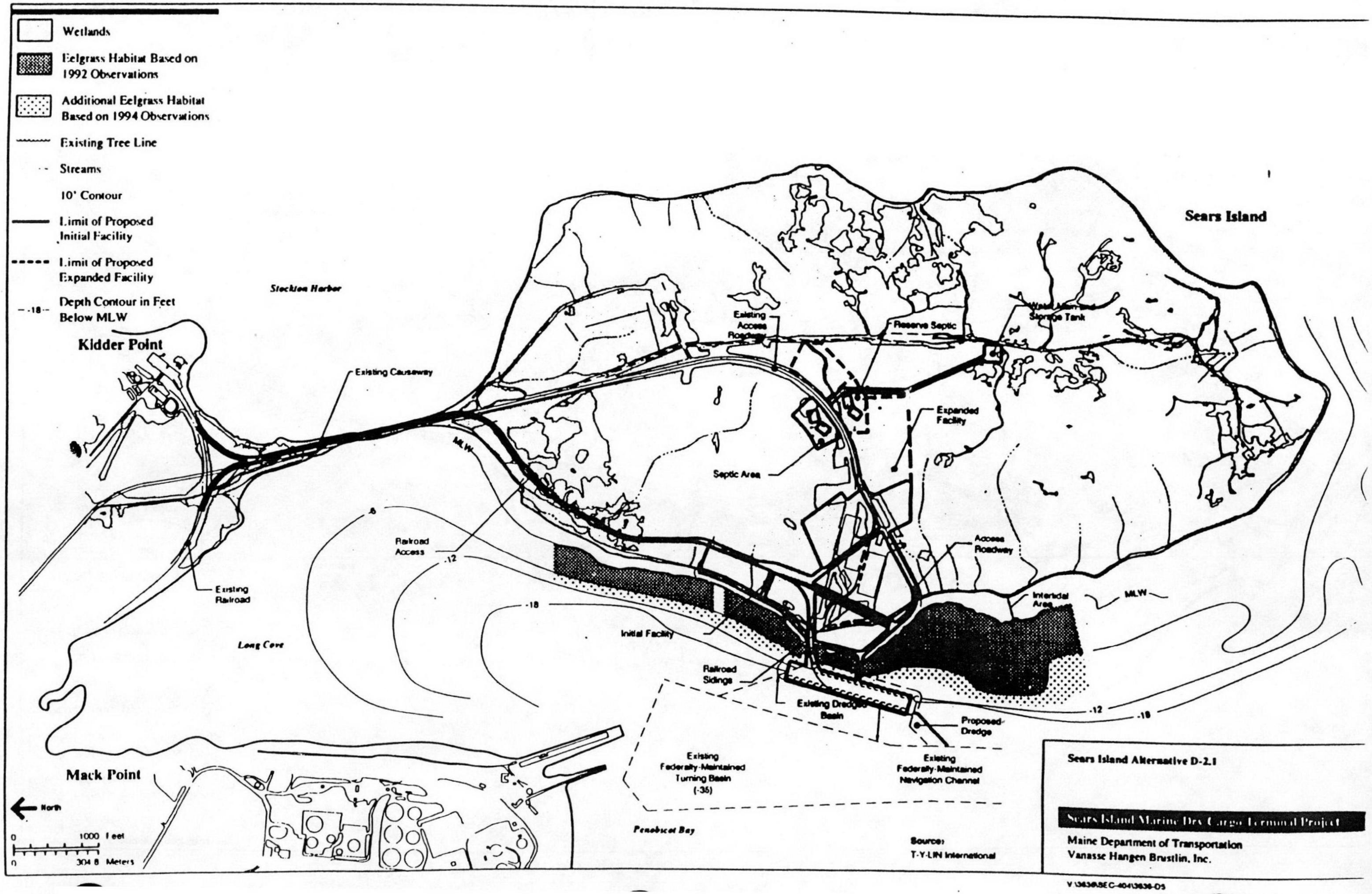
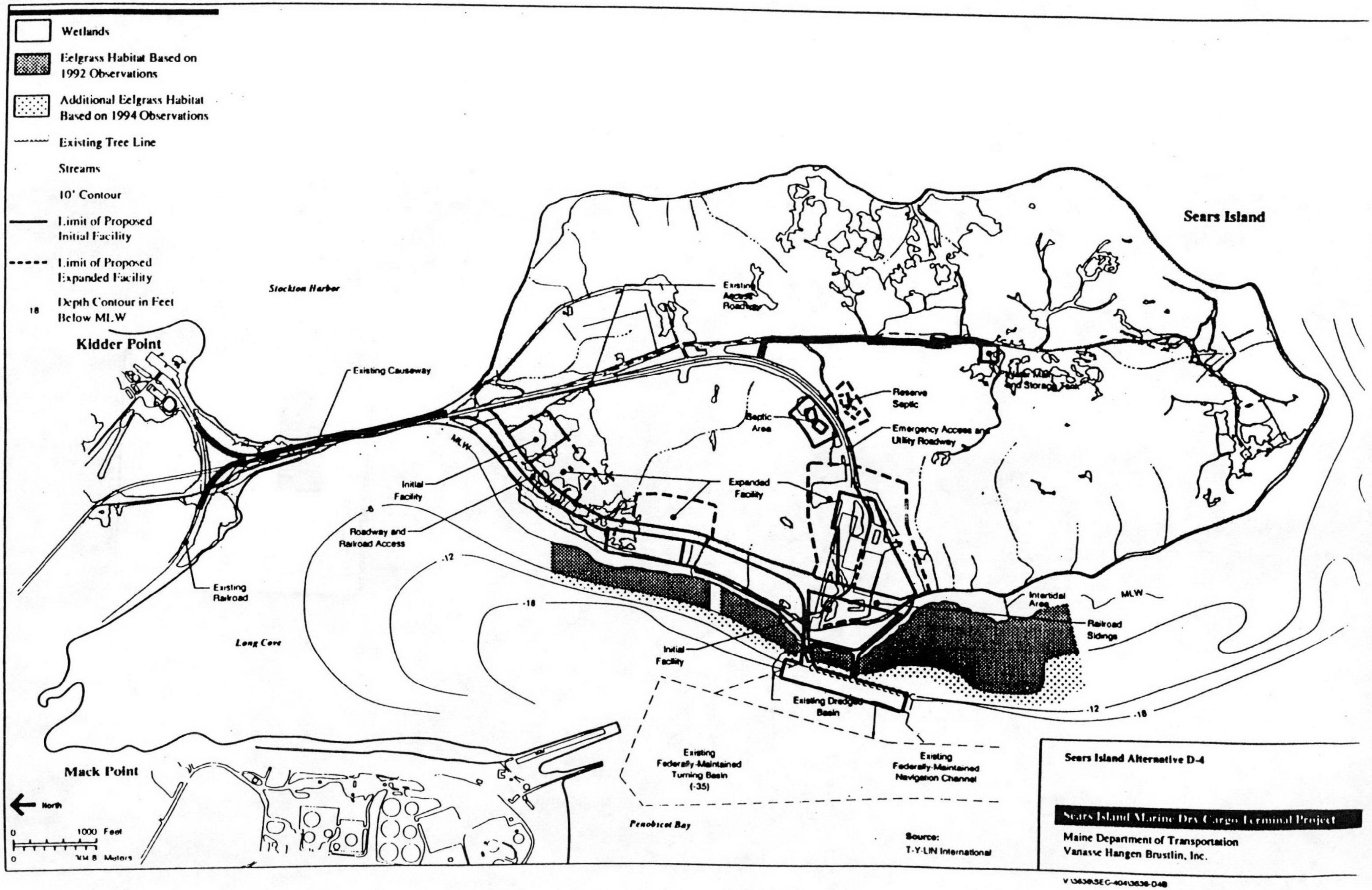
FIGURE 5



Wetlands
Eelgrass Habitat Based on 1992 Observations
Additional Eelgrass Habitat Based on 1994 Observations
Existing Tree Line
Streams
10' Contour
Limit of Proposed Initial Facility
Limit of Proposed Expanded Facility
Depth Contour in Feet Below MLW
Kidder Point
Stockton Harbor
Sears Island
Existing Causeway
Existing Access Roadway
Reserve Septic
Expanded Facility
Septic Area
Railroad Access
Existing Railroad
Access Roadway
Intertidal Area
MLW
Initial Facility
Long Cove
Railroad Sidings
Existing Dredged Basin
Proposed Dredge
Existing Federally-Maintained Turning Basin (-35)
Existing Federally-Maintained Navigation Channel
Mack Point
North
0 1000 Feet
0 304.8 Meters
Penobscot Bay
Source: T-Y-LIN International
Sears Island Alternative D-2.1
Sears Island Marine Dry Cargo Terminal Project
Maine Department of Transportation
Vanasse Hangen Brustlin, Inc.

FIGURE 6



Wetlands
Eelgrass Habitat Based on 1992 Observations
Additional Eelgrass Habitat Based on 1994 Observations
Existing Tree Line
Streams
10' Contour
Limit of Proposed Initial Facility
Limit of Proposed Expanded Facility
18
Depth Contour in Feet Below MLW
Stockton Harbor
Kidder Point
Sears Island
Existing Causeway
Septic Area
Reserve Septic
Emergency Access and Utility Roadway
Initial Facility
Expanded Facility
Roadway and Railroad Access
MLW
-6
-12
-18
Existing Railroad
Long Cove
Initial Facility
Intertidal Area
Railroad Sidings
Existing Dredged Basin
Existing Federally-Maintained Turning Basin (-35)
Existing Federally-Maintained Navigation Channel
Mack Point
North
0 1000 Feet
Meters
Penobscot Bay
Source: T-Y-LIN International
Sears Island Alternative D-4
Sears Island Marine Dry Cargo Terminal Project
Maine Department of Transportation
Vanasse Hangen Brustlin, Inc.